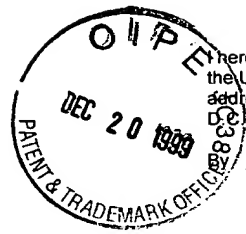


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Attorney Docket No.: IMM1P066.RE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re reissue application of:

Salcudean, *et al.*

Application No.: 09/307,023

Filed: May 7, 1999

For: CONTROLLER

Examiner: V. Chang

Art Unit:

**SUPPLEMENTAL REISSUE
DECLARATION UNDER 37 C.F.R.
§ 1.175(a)**

Commissioner of Patents and Trademarks
Washington, D. C. 20231

Sir:

We, Septimiu Edmund Salcudean and Allan J. Kelley, state and declare the following:

1. We have reviewed and understand the contents of the attached new claims as presented in this supplemental declaration for reissue of the original Letters Patent. This declaration is supplemental to the reissue declaration filed on May 7, 1999 for application for reissue of the above-identified United States Letters Patent.

2. We acknowledge the duty to disclose information of which we are aware and which is material to the examination of this application for reissue of the original Letters Patent in accordance with 37 C.F.R. § 1.56, including information which was discovered between the filing date of United States Patent Application Serial No. 07/965,427 that matured into the Letters Patent for which reissue is being sought and the filing date of the application for reissue.

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3. We verily believe that the original Letters Patent is partly or wholly inoperative or invalid by reason of our claiming more or less than we had a right to claim in the original Letters Patent, and that the errors described below which render said Letters Patent so partly or wholly inoperative or invalid occurred through inadvertence and/or omission without any fraudulent or deceptive intent on our part.

4. More specifically, we believe that the original Letters Patent for which we seek reissue claims more or less than we had the right to claim for the following reasons:

4.1. Column 7, lines 19-67 and column 8, lines 1-28 of the original Letters Patent includes what we believe to be an accurate and proper characterization of an interface device including a tactile feedback element, reproduced below:

The mouse handle 18 is shown in exploded view in FIG. 6 and includes as above described an actuator button 20 and a tactile element 22. The button 20 actuates a micro switch 118 while the tactile element 22 is controlled by an E-core type magnet 122 with a coil as schematically indicated at 124.

The structure of the tactile element is more clearly shown in FIG. 7 and includes an E-core magnet 122 with a coil 124 wrapped around its inner leg which is positioned to cooperate with a permanent magnet 126 mounted on the tactile element 22.

A pair of springs 128 and 130 tend to hold the tactile element in its lower most position as illustrated i.e. closest to the core 122, however when the coil is activated the repulsion of the magnet 126 from the core 122 and the coil 124 is stronger than the tension in the springs 128 and 130 so that the tactile element moves upwardly away from the core 122 with the amount of movement being dependent on the current in the coil 124.

The position of the tactile element 22 is such that it contacts with the hand of the user and when activated applies pressure thereagainst, the pressure being proportional to the amount of current passing through the coil 124.

Other types of handles may be used if desired, for example, the control handle 131 in FIG. 8, which takes the form of a joystick control may also be used and may be provided with further controller buttons as schematically indicated at 132 and further tactile elements as indicated at 134, 136, and 138 on the joystick 140. Tactile elements may be operated in a similar manner to the tactile element 22 described above and the control elements 132 may take the form of pressure switches or the like.

In the event a controller for controlling three degrees of freedom is required, the handle 18 or 140 may be replaced by or modified to provide z axis control, for example, instead of the tactile element 22 functioning as a tactile element it could be used as a z controller by providing a suitable position sensor to sense the position of the element 22 when it is displaced from a rest position or alternatively as a bi-stable switch for limited z direction control...

...The platform 154 is provided with a handle 168 moveable in the z direction on the rod 146 and 148 and is used to manipulate the platform 14.

4.2. The absence in the original Letters Patent of an independent claim in which a human-computer interface device provides tactile feedback to a user in accordance with displayed interactions between a controlled cursor and other graphical objects, including a physical object, one or more sensors, an actuator, and a microprocessor separate from the host computer, claimed without the recital of specific elements included in claims 1-18 of the original patent, such as is provided in new claim 76 below, is an error of inadvertent omission that occurred during the drafting and prosecution of the application that matured into the present Letters Patent. At the time of drafting and prosecution of the application that matured into the present Letters Patent, we did not perceive that a device that includes the above elements should be claimed independently, without the inclusion of other elements such as are included in claims 1-18 of the present Letters Patent. To cure the

aforementioned error of inadvertent omission, we therefore request the addition of a claim such as claim 76 below:

76. A human-computer interface device for controlling a graphical cursor displayed by a host computer and for providing tactile feedback to a user in accordance with displayed interactions between said cursor and other graphical objects displayed by said host computer, said interface device comprising:

a physical object to be manipulated by a user in two planar degrees of freedom;

one or more sensors that produce a locative signal responsive to and indicative of the position of said physical object in said two planar degrees of freedom;

an actuator that applies force to the user's hand along a tactile degree of freedom when current is flowed through a portion of said actuator, said tactile degree of freedom being different from said two planar degrees of freedom; and

a microprocessor separate from and in communication with said host computer, said microprocessor coupled to said sensor and to said actuator, wherein said microprocessor receives force information from said host computer and controls current through said portion of said actuator in accordance with said force information.

4.3. New dependent claim 77 would cure the inadvertent omission of claims which recite the subject matter of claim 76 and which also recites that two planar degrees of freedom are x and y axes and the tactile degree of freedom is a z axis substantially perpendicular to the x and y axes.

4.4. New dependent claim 78 would cure the inadvertent omission of claims which recite the subject matter of claim 76 and which also recites that the interface device is a mouse device and the physical object is a mouse.

4.5. New dependent claims 79-81 would cure the inadvertent omission of claims which recite the subject matter of claims 76 and which also recites that the actuator includes a wire coil through which the current is flowed, that the actuator includes a magnet core, and that the magnet core is an E-core.

4.6. New dependent claims 82 and 83 would cure the inadvertent omission of claims which recite the subject matter of claim 76 and which also recite that the sensor is an optical sensor, and that the sensor is an encoder.

4.7. New dependent claim 84 would cure the inadvertent omission of claims which recite the subject matter of claim 76 and which also recites that the device further includes a permanent spring coupled between the physical object and actuator.

4.8. New dependent claims 85-87 would cure the inadvertent omission of claims which recite the subject matter of claim 76 and which also recites that the actuator is controlled to indicate when the cursor displayed on the host computer is moved from one displayed menu element to another displayed menu element, that the actuator is controlled to indicate when the cursor displayed on the host computer crosses a window boundary, and that the actuator is controlled to indicate when the cursor displayed on the host computer is positioned over a graphical element.

4.9. New dependent claim 88 would cure the inadvertent omission of claims which recite the subject matter of claim 76 and which also recites that the actuator includes a portion that is moveable by the user along a z-axis to provide z-axis control to the host computer.

4.10. New dependent claims 89-92 would cure the inadvertent omission of claims which recite the subject matter of claim 76 and which also recite that the microprocessor receives host commands from the host computer and controls current through the portion of the actuator in accordance with at least one of the host commands; that the microprocessor receives host commands from the host computer and calculates forces to be applied to the user; and that the device further includes memory local to the microprocessor for storing values that are representative of the locations of images displayed by the host computer.

4.11. New dependent claims 92 and 93 would cure the inadvertent omission of claims which recite the subject matter of claim 76 and which also recite that a physical tactile element is coupled to the actuator and is moved to contact and apply pressure to the user's hand; and that the physical element applies pressure upon the

user's hand by pressing upward on the hand when current is flowed through the portion of the actuator.

4.12. We further believe that the absence in said Letters Patent of an independent claim reciting a joystick device providing tactile feedback to a user and including a joystick handle, at least one sensor, and an actuator mounted on the handle of the joystick, claimed without the inclusion of other elements included in claims 1-18 of the original patent, such as is provided in new claim 94 below, is an error of inadvertent omission that occurred during the drafting and prosecution of the application that matured into the present Letters Patent. At the time of drafting and prosecution of the application that matured into the present Letters Patent, we did not perceive that a mouse that includes the above elements should be claimed independently, without the inclusion of other elements such as are included in claims 1-18 of the present Letters Patent. To cure the aforementioned error of inadvertent omission, we therefore request the addition of a claim such as claim 94 below:

94. A joystick device for controlling a software application running on a host computer and for providing tactile feedback to a user in accordance with said software application, said joystick device comprising:

a joystick handle to be manipulated by a user in two degrees of freedom;

at least one sensor that produces a locative signal responsive to and indicative of the position of said handle in said two degrees of freedom; and

an actuator for applying tactile feedback upon the user's hand, said actuator mounted in the handle of said joystick, wherein said actuator is coupled to a physical element that is moved to contact and apply pressure to said user's hand.

4.13. New dependent claims 95-97 would cure the inadvertent omission of a claim which recites the subject matter of claim 94 and which also recites that the actuator includes a wire coil through which a current is flowed, that the actuator further includes a magnet core, and that the magnet core is an E-core.

4.14. New dependent claim 98 would cure the inadvertent omission of a claim which recites the subject matter of claim 94 and which also recites that the sensor is an optical sensor.

4.15. New dependent claim 99 would cure the inadvertent omission of a claim which recites the subject matter of claim 94 and which also recites that the actuator is controlled to apply pressure to the user's hand to indicate when the cursor displayed on the host computer is positioned over a graphical element.

4.16. New dependent claim 100 would cure the inadvertent omission of a claim which recites the subject matter of claim 94 and which also recites that the physical element includes a portion that is moveable by the user along a z-axis to provide z-axis control to the host computer.

4.17. New dependent claims 101-104 would cure the inadvertent omission of a claim which recites the subject matter of claim 94 and which also recites that the device includes a microprocessor separate from said host computer and coupled to the host computer by a communication bus and coupled to the sensor and actuator; that the microprocessor receives host commands from the host computer and calculates forces to be applied to the user; that the microprocessor receives host commands from the host computer and controls a current through a portion of the actuator in accordance with at least one of the host commands, where the current causes the pressure to be applied to the user's hand; and that the device includes memory local to the microprocessor for storing values that are representative of the locations of images displayed by the host computer.

4.18. We further believe that the absence in said Letters Patent of an independent claim reciting an interface device providing tactile feedback to a user and including a physical object moved by the user, at least one sensor, and an actuator that applies tactile feedback when the cursor is moved from one menu element to another menu element, claimed without the inclusion of other elements included in claims 1-18 of the original patent, such as is provided in new claim 105 below, is an error of inadvertent omission that occurred during the drafting and prosecution of the application that matured into the present Letters Patent. At the time of drafting and

prosecution of the application that matured into the present Letters Patent, we did not perceive that a mouse that includes the above elements should be claimed independently, without the inclusion of other elements such as are included in claims 1-18 of the present Letters Patent. To cure the aforementioned error of inadvertent omission, we therefore request the addition of a claim such as claim 105 below:

105. An interface device for controlling a graphical cursor displayed by a host computer and for providing tactile feedback to a user in accordance with displayed interactions between said cursor and other graphical objects displayed by said host computer, at least one of the graphical objects including a displayed menu having a plurality of menu elements, said interface device comprising:

a physical object to be moved by a user in two planar degrees of freedom;

at least one sensor that produces a locative signal responsive to and indicative of the position of said physical object in said degrees of freedom, said locative signal for use in controlling said cursor displayed by said host computer; and

an actuator that applies tactile feedback to the user's hand, said actuator including a magnet and a coil, wherein said actuator is controlled to apply bi-stable tactile feedback to said user that indicates when said cursor moves from one of said menu elements to another one of said menu elements.

4.19. New dependent claim 106 would cure the inadvertent omission of a claim which recites the subject matter of claim 105 and which also recites that a local microprocessor separate from the host computer is coupled to the sensor and actuator, and receives force information from the host computer, controls the tactile feedback, and transmits position data to the host computer.

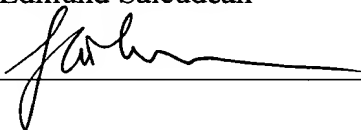
4.20. New dependent claim 107 would cure the inadvertent omission of a claim which recites the subject matter of claim 105 and which also recites that the actuator is coupled to a physical member that is moved to contact and apply pressure to the user's hand.

4.21. New dependent claim 108 would cure the inadvertent omission of a claim which recites the subject matter of claim 106 and which also recites that the actuator is controlled by the local microprocessor to apply the tactile feedback when the cursor displayed on the host computer is moved across a displayed window boundary.

5. We hereby declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

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Inventor's signature: _____



Date: Dec. 10, 1999

Country of Citizenship: Canada

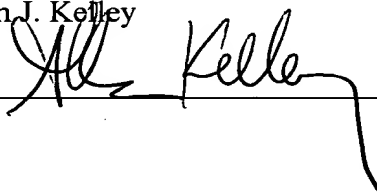
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